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EXAMINER

WOZNIAK, JAMES S

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/019,125	ASANO ET AL.	
	Examiner James S. Wozniak	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 11 April 2007.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-9 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-9 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 10 May 2002 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No: _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date _____. _____	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Response to Amendment

1. In response to the office action from 12/11/2006, the applicants have submitted an amendment, filed 4/11/2007, amending claims 1, 8, and 9, while arguing to traverse the art rejection based on the limitation regarding the sequential updating of concatenation information based on a calculated score (*Amendment, Pages 10-12*). Applicant's arguments have been fully considered, however the previous rejection is maintained, altered only with respect to the added limitations, due to the reasons listed below in the response to arguments.
2. In response to the amended title of the invention, the examiner has withdrawn this previous objection to the specification.
3. In response to amended claims 1, 8, and 9, the examiner has withdrawn the previous 35 U.S.C. 112, first and second paragraph rejections.

Response to Arguments

4. Applicants' arguments have been fully considered but they are not persuasive for the following reasons:

With respect to independent claims 1,8, and 9, the applicants argue that Higgins et al (U.S. Patent: 5,218,668) fails to teach concatenation information and the sequential update of such information based on a score (*Amendment, Pages 11-12*). In response, the examiner notes that Higgins does teach concatenation information used in speech recognition as well as its sequential update based on score.

More specifically, Higgins discloses a method for speech recognition in which two types of candidates are selected. The first type of candidate is selected based on a matching algorithm using a keyword template (*Col. 4, Lines 49-66; and Col. 6, Lines 16-46*). The second type of candidate is selected based on a matching algorithm using a filter *template* (*Col. 4, Lines 49-66; and Col. 6, Lines 16-46*). Both types of candidates are evaluated using previously concatenated word sequences stored in a buffer (*Col. 6, Lines 16-46*). In other words, a candidate for a current speech frame is added or concatenated to previously concatenated string portions to calculate an accumulated distance score for a particular string of candidate recognition templates up to the current frame. As new frames are sequentially processed, further candidates are concatenated to the existing partial strings and associated distance scores are accumulated or updated (*Col. 6, Lines 44-46*). At the last frame, the concatenated full sequence with the best score is selected as the recognition output (*Col. 6, Lines 38-46*). Thus, since Higgins teaches concatenating previous recognition candidates to form partial strings having associated distance scores (i.e., “concatenation information”) and accumulating scores for partial strings by further concatenating candidates for a current frame to the existing partial strings to produce an updated score (i.e., “concatenation information is updated based on the score”), independent claims 1, 8, and 9 remain rejected.

The independent claims are argued as further limiting rejected independent claims (*Amendment, Page 12*). In response to such arguments, please see the above comments directed towards claims 1, 8, and 9.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claims 1 and 7-8** are rejected under 35 U.S.C. 102(b) as being anticipated by Higgins et al (*U.S. Patent: 5,218,668*).

With respect to **Claims 1 and 8**, Higgins discloses:

Extraction means for extracting characteristic values of said input speech, the input speech comprising a plurality of input words (*speech parameter extraction, Col. 5, Lines 45-63; and input speech corresponding to a word sequence, Col. 6, Lines 16-46*);

Selection means for selecting one or more candidate first words from the plurality of input words to be processed by speech recognition processing, based on a first measure calculated using said characteristic values (*determining a first word hypothesis set based on a matching algorithm utilizing a keyword template, Col. 4, Lines 49-66; and Col. 6, Lines 16-46*), and for selecting one or more candidate second words from the plurality of input words based on a second measure different from said first measure (*determining a second word hypothesis set*

based on a matching algorithm utilizing a filler template relating to keywords, Col. 4, Lines 49-66; and Col. 6, Lines 16-46);

Score calculation means for calculating said score of said candidate first and candidate second words selected by said selection means referencing concatenation information of said first and second words (*scoring a template string from a concatenation of partial strings of existing candidates located in a phrase buffer with current template candidates, Col. 6, Lines 16-46; and Col. 8, Line 9- Col. 9, Line 65*); and

Finalizing means for finalizing a words string, as the recognition result of said speech based on said score (*finalized recognition output corresponding to a string of most likely word templates, Col. 6, Lines 63-67; and finalizing phrase recognition, Col. 9, Lines 26-54*), wherein the word concatenation information is sequentially updated based on the score (*accumulating scores for partial strings by further concatenating candidates for a current frame to the existing partial strings to produce an updated score, Col. 6, Lines 16-46*).

With respect to **Claim 7**, Higgins recites:

The selection means calculates said score using characteristic values of the speech to select said first word based on said score (*extracted speech parameters used in keyword template matching, Col. 5, Lines 45-63; and Col. 6, Lines 16-21*).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al in view of Hon et al (*U.S. Patent: 5,963,903*).

With respect to **Claim 2**, Higgins teaches the speech recognition system utilizing keyword and alternative model matching to generate candidate hypotheses in recognizing an input speech sequence, as applied to claim 1. Higgins does not teach the use of an alternative hypothesis scoring means related to a specific number of phonemes satisfying a pre-set condition, however Hon teaches a means for a non-acoustic ranking and selection of phoneme recognition candidates in a word through a phoneme misrecognition count (*Col. 10, Lines 16-51*).

Higgins and Hon are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Higgins with the phoneme ranking and selection means taught by Hon in order to implement an accurate alternative speech recognition system that does not require a user to speak a large number of words in training (*Hon, Col. 5, Lines 15-36*).

9. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al in view of Chiang et al ("On Jointly Learning the Parameters in a Character-Synchronous Integrated Speech and Language Model," 1996).

With respect to **Claim 3**, Higgins teaches the speech recognition system utilizing keyword and alternative model matching to generate candidate hypotheses in recognizing an input speech sequence, as applied to claim 1. Higgins does not teach the use of an alternative hypothesis scoring means related to a part-of-speech; however Chiang teaches an HMM based recognizer that utilizes part-of-speech tags in scoring to determine a best recognition hypothesis (*Page 168, Fig. 1*).

Higgins and Chiang are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Higgins with the scoring means related to a part-of-speech tag as taught by Chiang in order to achieve an alternative recognition measure having an improved recognition rate and a reduced error rate (*Chiang, Page 168*).

10. **Claims 4 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al in view of Franz et al (*U.S. Patent: 6,178,401*).

With respect to **Claim 4**, Higgins teaches the speech recognition system utilizing keyword and alternative model matching to generate candidate hypotheses in recognizing an input speech sequence, as applied to claim 1. Higgins does not teach the use of an alternative hypothesis scoring means related to a linguistic likelihood, however Franz discloses the use of a language model that determines a score based on linguistics (Col. 6, Line 42- Col. 7, Line 6).

Higgins and Franz are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Higgins with the scoring means related to a

linguistic likelihood as taught by Franz in order to provide an alternative recognition means that enhances the probability of selecting a correct recognition candidate (*Franz, Col. 6, Line 61- Col. 7, Line 6*).

With respect to **Claim 9**, Franz further recites implementing a speech recognition method as a program stored on a computer readable medium (*Col. 2, Lines 42-67*).

11. **Claims 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins in view of Holt et al (*U.S. Patent: 5,960,447*).

With respect to **Claim 5**, Higgins teaches the speech recognition system utilizing keyword and alternative model matching to generate candidate hypotheses in recognizing an input speech sequence, as applied to claim 1. Higgins does not teach the use of a storage means for memorizing speech recognition results and using the results in a subsequent alternative recognition, however Holt discloses a means for storing a confidence score from a recognition engine for use in a speech recognition process (*Col. 9, Lines 7-61*).

Higgins and Holt are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Higgins with the confidence score storage means taught by Holt in order to provide an improved alternative speech recognition means for editing and correcting speech recognition results (*Holt, Col. 1, Line 65- Col. 2, Line 21*).

With respect to **Claim 6**, Holt further recites:

Inputting means for providing an input for correcting the results of speech recognition; wherein said storage means stores the results of the speech recognition corrected by the input

from said inputting means (*editing a recognition result and updating a confidence score, Col. 9, Lines 36-61*).

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Jiang et al (*U.S. Patent: 6,542,866*)- discloses a speech recognition method that scores candidate words based on different types of feature vectors.

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632.

The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
6/7/2007



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SUPERVISORY PATENT EXAMINER